Duration: 3 Hours **Marks :- 80**

Please check whether you have got the right question paper.

N.B.: **1) Question 1. Is compulsory.**
2) Solve any three out of remaining question.
3) Assume suitable data if necessary.

Q.1	a)	Explain the use of commutator in DC motor.	**05**
	b)	Explain Armature Reaction in DC machine.	**05**
	c)	Explain difference Electric Circuit and develop circuit.	**05**
	d)	Explain the principle of energy conversion and develop the model of an Electromechanical energy conversion device.	**05**
	e)	Write the Applications of stepper motor.	
Q.2	a)	Explain the concept of singly excited machines and derive the expression for the electromagnetic torque.	**10**
	b)	Explain the electrical braking methods for DC motor.	**10**
Q.3	a)	A 230 V shunt motor running on no load and at normal speed takes an armature current of 2.5 Amp from 230V supply mains. The field circuit resistance is 230Ω and the armature circuit resistance is 0.3 Ω. Calculate the motor output and efficiency when total current taken from the mains is 35 Amp. If the motor is used as a 230v shunt generator. Find the efficiency and the input power for an output current of 35 Amp.	**10**
	b)	Write the short notes on Doubly excited magnetic field.	**10**
Q.4	a)	Explain the construction and working of permanent magnet stepper motor.	**10**
	b)	With the help of neat circuit diagram explain the swinburns Test.	**10**
Q.5	a)	Explain methods of speed control of DC motor.	**10**
	b)	The Hopkinson's test on two shunt machinery gave the following result for full load. Line voltage = 250V, current taken from supply system excluding field current = 50A, motor. Armature current = 380A, field currents =5A and 4.2 A. calculate the efficiency of the machine working as a generator. Armature Resistance of each m/c is 0.02Ω.	**10**
Q.6	a)	Explain four point starter.	**10**
	b)	Write down the applications of DC shunt and series motor.	**10**

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